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Business groups, investment, and firm value

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Appendix A

The Tata Group: an example

The Tata Group is the largest and most distinguished business group in India. Starting in 1874 with a single textile mill, the group nowadays contains more than 80 firms in seven main business sectors (materials, engineering, energy, chemicals, consumer products, communications and information systems, and services). In 1995, it had sales of Rs. 220 billion and 270,000 employees and it has a leadership position in many industries.¹ Table A.1 describes the diversification pattern of the Tata group over the 130 years of its existence.

The founder of the Tata Group, Jamshedji Tata, already started to expand his industries to steel, hydroelectric power, modern manufacturing methods, and technical education and research. Tata Sons Ltd., which now is the principal investment holding company of the Tata Group, was the promoter of many new ventures in the first half of the twentieth century and continued to promote and manage all major Tata Group companies until 1970. After this, the managing agency system was abolished, and the group was no longer a legal construct.

A lot of interdependence remained, however, and Tata Sons still offers the Tata companies consultancy, management, and financial services. Tata Sons is also the proprietor of the Tata brand name, which is a registered trademark for a variety of product classes. The Tata brand name is one of the most valuable assets of the Tata Group. Tata Sons is not only the proprietor of this name, but is also responsible for promoting it at a central

¹The information in this appendix is obtained from Khanna, Palepu and Wu (1998), Khanna and Palepu (2004), the Tata Group website, and Piramal (1998).

Table A.1. Diversification pattern of the Tata Group

year	industry entered	industry exited
1874	textiles	
1902	hospitality	
1907	steel	
1910	power	
1912	cement	
1917	soaps and toiletries	
1931	printing and publishing	
1932	aviation	
1939	chemicals	
1940	consumer electronics	
1952	cosmetics	
1953		aviation
1954	air-conditioning	
1958	pharmaceuticals	
1962	tea and coffee	
1968	information technology	
1970		locomotives
1984	watches	
	financial services	
1993	auto components	soaps and toiletries
1994	telecom services	
1998	passenger cars	cosmetics and pharmaceuticals
1999	retail	
2000		cement
2001	insurance	textiles
2003		printing and publishing

level. Companies that want to use this name have to subscribe to the Tata Brand Equity Scheme, implying the payment of a fee and the subscription to a code of conduct, ensuring high standards of quality and ethical business practices. The Tata Sons Ltd. Board is made up of the chairpersons or CEOs of major operating Tata Group companies, and the elected chair of the Board of Tata Sons is recognized as the Group Chairman.

The main Tata companies are Tata Engineering and Locomotive Com-

pany (Telco), Tata Iron and Steel Company (Tisco), Tata Power, Associated Cement Company (ACC), Tata Chemicals, Tata Tea, and Indian Hotels. Together, these companies account for more than 80 percent of the Tata group's sales. The relative independence of these companies is illustrated by the fact that they diversified into new businesses, sometimes with little coordination. There exist cross-holdings of equity between these companies and Tata Sons. In 1996, Tata Sons held a minority stake in these companies varying from 3 to 13 percent; the Tata companies together owned almost 13 percent of Tata Sons. Moreover, there is a lot of activity between these and other Tata group companies. In some cases, this takes the form of intra-group loans, but more often firms invest in other group companies or new ventures. The companies are not only related through financial ties. Very often, they also have interlocking directorates, so that a relatively small group of managers and directors controls a large part of the group companies.

Many of the new ventures are set up by another important part of the Tata Group, Tata Industries Ltd. (TIL). This holding company, which was established in 1945, was the managing agency for the Tata Group until 1970. In 1983, following the preparation of a long-term strategic plan, Tata Industries pioneered the entry of the Tata Group into several new sectors (advanced electronics, biotechnology, advanced materials, and alternative energy). These sectors were expected to have a significant impact on India's economy in the future. Since then, Tata Industries has functioned as the catalyst for the introduction of new businesses within the Tata Group. These ventures were often partly financed by Tata Sons and the main Tata Group companies. TIL generally maintained a 10 to 20 percent stake in these new ventures. Another way in which the Tata Group companies cooperate is in the recruitment of talented managers by Tata Administrative Services (TAS). New TAS officers are encouraged to rotate among the Tata companies, and to take advantage of the opportunity to work in several industries. The TAS program was set up in order to increase the mobility of managerial talent among group companies.

Appendix B

The system GMM estimator

A standard way of eliminating the individual effects when the regressors are correlated with this component of the error term is the transformation in first differences. However, when there are regressors (or instruments) available that are uncorrelated with the individual effects, these variables can be used to consistently estimate the untransformed model. The system generalized method of moments (GMM) estimator combines the moment conditions obtained from the equation in first differences with the extra moment conditions obtained from the equation in levels. Because it uses the extra information from the untransformed model, the system GMM estimator is more efficient than the first difference GMM estimator. We report two-step GMM estimates, that were estimated using finite sample corrected standard errors (see Windmeijer, 2005). Asymptotic standard errors of the efficient two-step GMM estimator can be severely downward biased in small samples. Therefore, most researchers present coefficients and standard errors based on one-step estimates. Windmeijer (2005) shows how the two step standard estimates can be corrected, and we have followed this approach.

The consistency of the system GMM estimator crucially depends on the validity of the instrumental variables. We test the validity of the instruments by performing a Sargan-Hansen test of overidentifying restrictions. Under the null hypothesis of orthogonality of the instruments, the test statistic is asymptotically distributed as a χ^2 with as many degrees of freedom as overidentifying restrictions. We report the probability of incorrectly rejecting the null hypothesis. We also test the validity of the additional instruments

for the levels equation. Basically, because the set of instruments used for the first differenced model is a subset of the set of instruments used in the system GMM estimator, the validity of the additional overidentifying restrictions can be tested by comparing the Sargan statistic for the system estimator and the Sargan statistic for the model in first differences. This Difference Sargan statistic is distributed as a χ^2 with as many degrees of freedom as the additional overidentifying restrictions. This statistic is also reported, together with the appropriate p-values.

Another essential assumption for the consistency of the system GMM estimator is the assumption of no serial correlation in the idiosyncratic error terms. If this assumption is correct, we would expect the differenced residuals (i.e., $v_{it} - v_{i,t-1}$) to display significant negative first-order serial correlation and no second-order serial correlation. We present tests for first-order and second-order serial correlation in the estimated residuals in first differences. The test statistics (M1 and M2 in the table) are asymptotically distributed as standard normal variables under the null of no serial correlation. The serial correlation tests refer to the one-step GMM estimates.

We also present Wald tests of joint significance of all or a subset of parameters. The test statistic is asymptotically distributed as a χ^2 .